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Excessive Gas: What Can Be Done?

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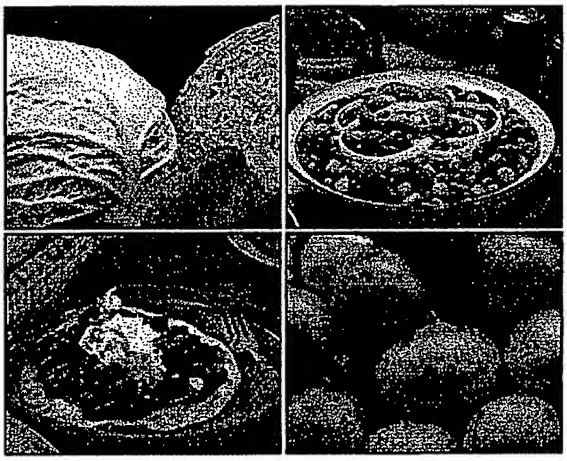

Perhaps the most frequent gastrointestinal complaint, intestinal gas is one of the more embarrassing symptoms for which patients seek assistance.[1] While passing gas is normal, patients often have several concerns.

Some are fearful of passing gas with others present. Others experience discomfort due to excessive gas or passage of gas. Still others fear that gas denotes some dangerous underlying disease, such as cancer.[2] The pharmacist can tactfully provide information to allay the patients' fears and to help them reduce the quantity of gas they produce.

What Is Flatulence?

How does the patient concerned about flatulence gauge whether his or her intestinal gas is excessive? In one study of healthy subjects aged 21–59, diaries revealed that gas was excreted an average of 10 times daily (although other authorities quote a figure of 14 per day).[3,4] The volume of gas passed per episode ranges from 33–125 mL. More than 10 passages of gas daily could be considered excessive. Males and females do not differ in this respect, so this figure is valid regardless of gender. Approximately 20% of patients aged 65–93 experience abdominal distention,[2] often due to gaseous buildup.

Some patients complain of excessive gaseousness when the volume they produce is within normal limits. In these cases, the patient may be more acutely sensitive to passage of gas through the GI tract.

Unless swallowed air is expelled by belching, it will be eliminated as intestinal gas.

Etiology of Excessive Gas

Intestinal gas originates from several sources.

Dietary Factors: A major source of gas is ingestion of complex carbohydrates (e.g., raffinose, stachyose, verbascose) that cannot be broken down into component sugars for absorption.[5] These undigestible carbohydrates then serve as substrates for bacterial fermentation, yielding gas as a by-product. The patient teaching aid information page describes specific foods that tend to cause gas, since diet can be manipulated by the patient. However, a few additional dietary points deserve consideration. Sugar-free foods often contain sorbitol or fructose, which are both poorly absorbed in the small intestine. This poor absorption leads to gas.[2] Sorbitol is one of the hexitol sugar alcohols, frequently implicated in the condition known as "chewing gum diarrhea" or "dietetic food diarrhea."[6] Thus, the patient who chews sugar-free gum to control caries and the diabetic patient who utilizes dietetic foods to control weight are at high risk of flatulence and diarrhea. Reducing intake of sugar-free foods may help prevent gaseousness.

Air Swallowing: Atmospheric air consists mainly of oxygen and nitrogen in a 20:80 ratio. Some patients swallow excessive atmospheric air for a variety of reasons. Unless this air is expelled by belching, it will be eliminated as intestinal gas. The person who eats lying down not only swallows more air but cannot belch it back out. This is because the position of the esophagus, which enters the stomach at the back and top, does not allow air to exit in the reclining patient.[5]

Sodium Bicarbonate: Sodium bicarbonate is not a good choice as an antacid for several reasons (e.g., systemic alkalization, the milk-alkali syndrome, short duration of action). It also produces gas while neutralizing stomach acids. As little as a half teaspoon of sodium bicarbonate liberates as much as 475 mL of carbon dioxide.[2] Therefore, pharmacists should advise against sodium bicarbonate use as an antacid.

Lactase Deficiency: When a patient lacks intestinal lactase, undigested lactose passes into the colon, where bacterial fermentation occurs. Several troubling symptoms result, one of which is excess flatulence.[7] Lactase deficiency might be suspected when flatulence is accompanied by diarrhea, stomach rumbling, abdominal pain, and abdominal bloating, all occurring within several hours after lactose ingestion. Three approaches may be tried to reduce the symptoms of lactose intolerance. In one, patients reduce the amount of lactose ingested until symptoms no longer occur. This may mean a drastic reduction in the amount of milk and dairy products patients ingest. In the second approach, patients

ingest exogenous lactase (e.g., Lactaid, Dairy Ease) in the form of tablets or capsules at the same time that lactose is taken in, allowing breakdown of lactose to occur. Finally, patients may add lactase drops to milk and wait 24 hours before drinking it. During this time, lactose breakdown will occur. If these simple measures fail to resolve the problem, the patient should visit a physician.

Irritable Bowel Syndrome: Some patients who complain of excessive gas actually have a normal amount of gas but experience a bloated feeling. Bloating without excessive gas is often indicative of irritable bowel syndrome, a motility disorder associated with abdominal pain, constipation or diarrhea. In this case, the patient should see a physician.[8]

Gallbladder Involvement: A well-known gallbladder complaint is known as flatulent dyspepsia.[9,10] The patient with flatulent dyspepsia belches repeatedly; eats a normal-sized meal but feels stuffed; may not be able to finish a normal meal; complains of abdominal distention so severe that clothes must be loosened; and experiences upper abdominal burning, nausea, vomiting or gastroesophageal reflux. If flatulent dyspepsia is suspected, the patient should be referred—a cholecystectomy may be necessary.

Bowel Obsessions

Occasionally patients develop an unhealthy fear of flatulence and its social consequences. In one case, a 35-year-old man had never actually been flatulent around people but became preoccupied with fear that such an episode might occur.[14] For the next 35 years, he gave up a highly successful business career and engaged in extreme social withdrawal. His psychiatrist classified his bowel obsession as a social phobia. Administration of nortriptyline produced marked improvement in the patient.

In a second case, a 28-year-old male became preoccupied with purity of foods and flatulence, starting his own diet regimen. The patient once broke his hand hitting a wall in response to his fear of losing control over flatulence.[16] His symptoms improved remarkably when he was given fluoxetine. The drug caused a remission of symptoms that allowed the patient to work full-time.

The Composition of Intestinal Gas

The primary components of intestinal gas are carbon dioxide, methane, nitrogen, oxygen and hydrogen.[2] Nitrogen and oxygen come from swallowed air, and hydrogen and carbon dioxide are by-products of bacterial fermentation. Methane is produced by certain methanogenic bacteria.[11] These gases are odorless. It is the trace gases (in concentrations as low as one part per million) that produce the odor of intestinal gas. These trace gases include sulfur-containing compounds such as methanethiol, dimethylsulfide, and hydrogen sulfide.[12] Hydrogen sulfide is produced by sulfate-reducing bacteria.

The Flatus Diary

Patients may not be able to relate episodes of excess flatulence to any particular dietary factor at first.

Alternatively, the patient may harbor unfounded suspicions about certain foods. Much uncertainty can be eased if patients keep a flatus diary. In it they should record foods eaten, drinks ingested and times of each flatulence episode. In this way, the diary helps identify which foods are causing excess gas.

The Role of Simethicone

Simethicone is a defrothicant used in manufacturing to eliminate bubbling in processes that involve liquid movements. It is also used in certain medical procedures such as endoscopy, during which air is inadvertently infused into the gastrointestinal tract. When this air mixes with biliary secretions, a froth that obscures the endoscopist's vision is generated.[2] For many years, this problem has been prevented by placing simethicone on the surface of the endoscope prior to insertion.

Simethicone is also useful in reducing frothing in the lumen of the gastrointestinal tract. This effect does not reduce the actual amount of gas in the intestinal lumen. In fact, in some studies, simethicone does not exhibit any beneficial effect on symptoms of intestinal gas.[13] However, the product was rated as safe and effective by the FDA as a treatment for excess gas. There are several possible reasons why it may help some patients. Passage of gas through the bowel lumen may be facilitated by use of simethicone. Simethicone may also allow patients to excrete a greater volume of gas at one time, thereby reducing the number of flatus events. Thus, less residual gas is present to cause uncomfortable cramping.

The Role of Alpha-Galactosidase

Alpha-galactosidase is an enzyme derived from Aspergillus niger. This enzyme breaks down oligosaccharide linkages, which humans cannot digest.[14] It allows patients to absorb single component sugar residues. In one study, volunteers were given two meals of meatless chili composed of several types of beans, cabbage, cauliflower and onions.[14] They were also given either a placebo or the commercially available alpha-galactosidase product known as Beano. Beano reduced the number of flatulence events at all times except for 2 hours post-ingestion. The effect was most pronounced at 5 hours after the meal.

To use Beano solution, patients place approximately 5 drops on the first bite of food. However, if the patient still experiences flatulence, the amount can be adjusted upward until an effective dose is reached. The patient may also swallow or chew 2–3 Beano tablets with the first bite of food or crumble them onto the first bite. That number of tablets usually controls gas associated with the ingestion of 0.5–1 cup of food. More tablets can be used for larger servings.

Patients cannot cook with Beano because the heat induces enzyme degradation. Patients who are allergic to molds should not use the product. Patients with galactosemia should consult a physician before using Beano because enzymatic degradation of oligosaccharides produces galactose.

The Addition Diet

The patient whose flatulence responds poorly to other measures may be placed on an addition diet.[2] The patient eliminates all foods except those known not to produce symptoms. These foods are ingested for several days to ensure that symptoms are absent (a state known as "normoflatulence").

Then, one new food is added each 48 hours. With the help of the flatus diary, each new food is rated as to its propensity to cause gas. Once a troublesome food is identified, it is eliminated from the diet for the

duration of the addition diet. The diet is continued until all suspected foods have been tried. The patient then has a list of foods to avoid or moderate intake.

Preventing and Treating Excess Gas

Intestinal gas is often a source of humor, but for the person who experiences uncomfortable gas in a crowd, it is no laughing matter. There are many points to consider in reducing gas and passing it more easily.

Swallowed Air: A common source of intestinal gas is air that has been swallowed. Several factors cause people to swallow air. For instance, if dentures do not fit well, the person tends to swallow more saliva, which carries air bubbles with it. Therefore, dentures should be fitted properly. If postnasal discharge is present, patients tend to swallow more often, carrying more air to the stomach. A nasal decongestant may help alleviate this problem. Smoking a cigar or pipe may also increase the amount of saliva produced and swallowed, contributing to excess gas.

Some patients have a nervous habit of belching frequently. To do this, they swallow air, which they then belch. Unfortunately, the patient seldom is able to belch out all of the swallowed air, thus producing intestinal gas.

Rapid eating increases the amount of air that people swallow. Patients should pace their eating and chew each bite thoroughly. Gum chewing and sucking on hard candies also increase the amount of air swallowed. Patients should reduce these habits.

Dietary Factors: The most well-known source of intestinal gas is certain foods, such as beans. Beans cause gas because the body cannot digest the complex sugars (carbohydrates or starches known as disaccharides) they contain. These starches pass into the intestine, where bacteria normally found there can use them as a food source. When bacteria use them as food, they produce gas as a by-product. In addition to beans, such foods as broccoli, cabbage, brussels sprouts and cauliflower cause uncomfortable excess gas.

Carbonated drinks are also a major cause of gaseousness. These drinks contain a great deal of gas, indicated by the large number of bubbles that form at the top of the drink when it is poured. Some gas is also created as the drink enters the mouth. This gas is usually swallowed. More is liberated in the stomach, which may become painfully swollen even before the gas passes into the intestines, where it later causes more gas. In order to avoid gaseousness, patients should eliminate carbonated beverages from their diets. If this is not an option, patients may leave drinks open at room temperature for several hours and stir them frequently to allow the carbonation to escape into the atmosphere.

Beer also contains gas, as noted by its frothy head. To control excess gas, beer intake should also be reduced or eliminated.

Your pharmacist can suggest ways to ease gas problems. The use of simethicone

tablets may allow easier elimination of gas. Also, a product known as Beano (available in tablet or liquid form) can be taken with foods that cause gas. Beano contains an enzyme that breaks down carbohydrates before they can cause gas.

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